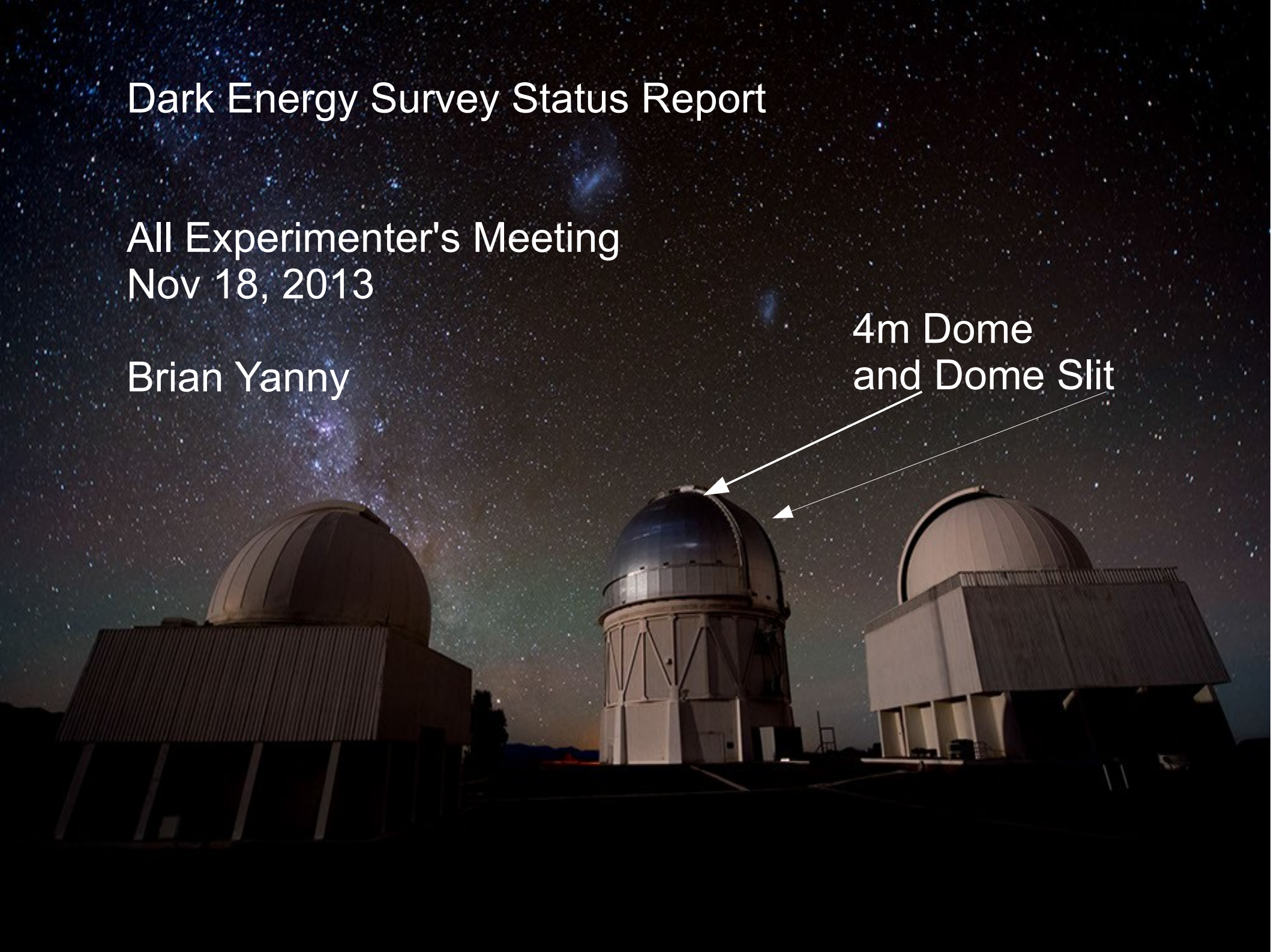
Dark Energy Survey Status Report

All Experimenter's Meeting
Nov 18, 2013

Brian Yanny



Survey Strategy: Where do we point the DECam next?

DES is assigned 525 nights on the 4m Blanco telescope
105 nights/year through Feb 2018.

In this time, DES Wide Field survey needs to obtain
10 images of 5000 square degrees of sky in each
of 5 bands to survey depth. Each image covers ~2.5 sq deg,
Therefore need about 250,000/2.5 = 100,000
exposures in 500 nights, or roughly 200 (of 100 seconds each)
good exposures per night. [There's also a supernova
survey].

Though time lost due to bad weather has gone into
planning the 525 night total, the margin
or error to get the full survey in the time allotted is slim.

Nov 15, 2013

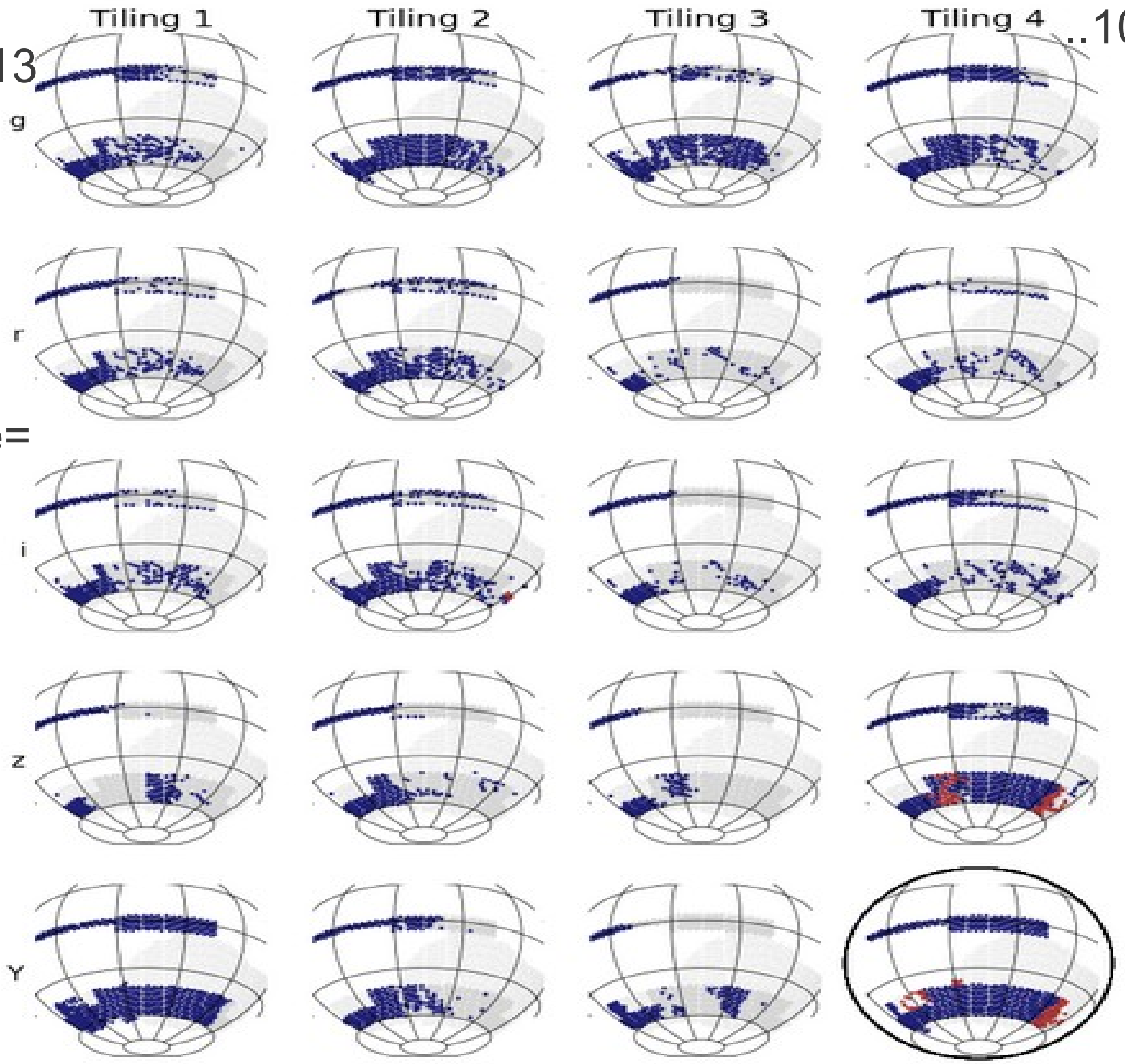
Coverage:

Dark blue=
Done

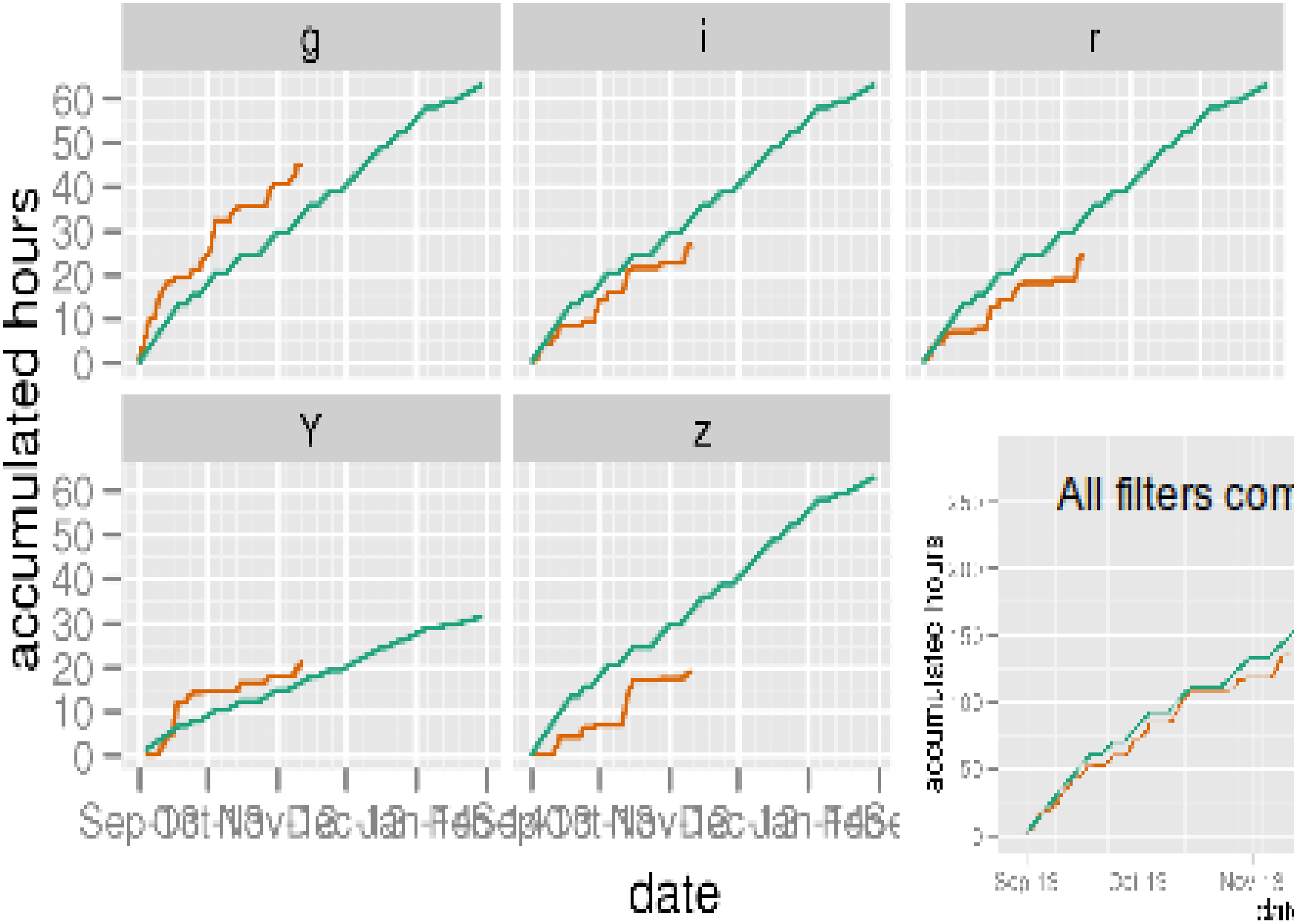
Lighter blue=
Footprint

Red =
Done last
Night
(Nov 14)

**Current
Year 1
Status:**



Weak Lensing uses *riz* filters: more stringent observing conditions



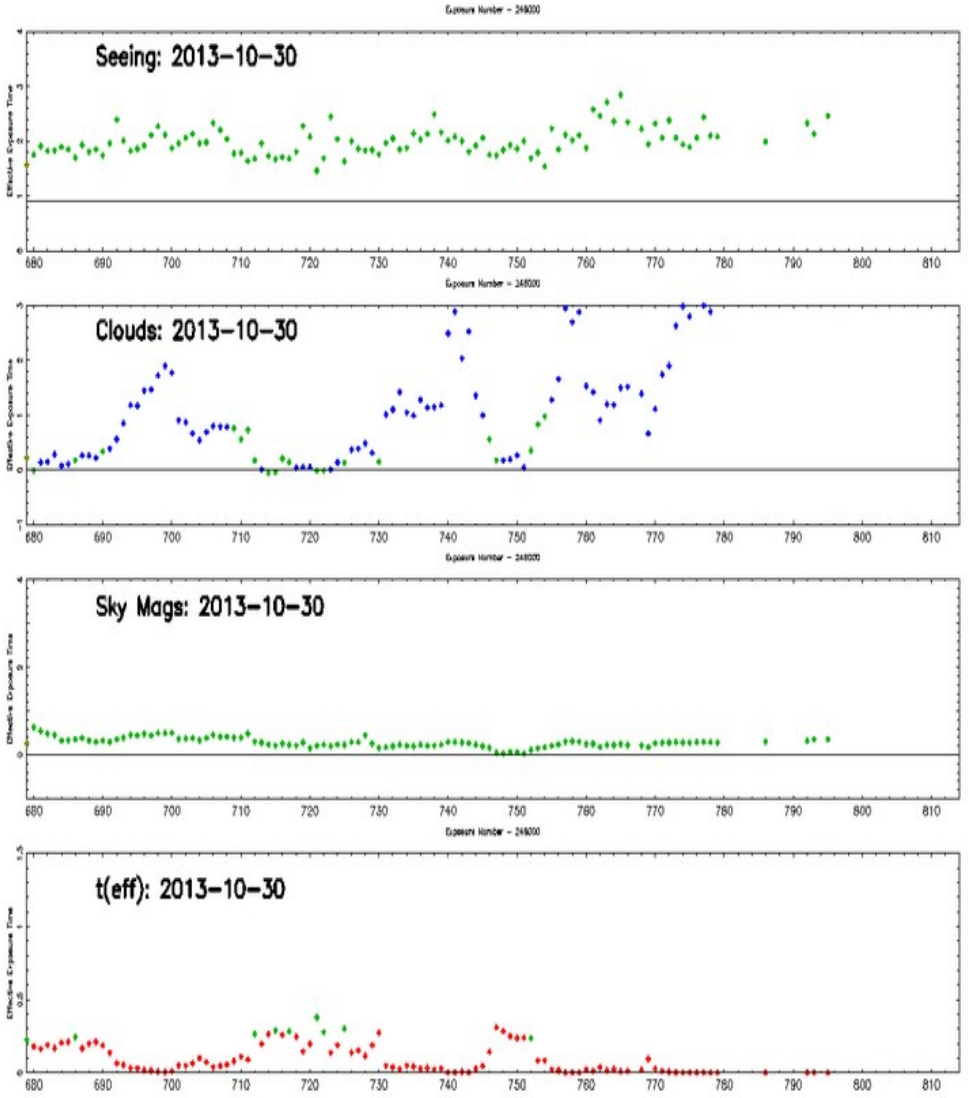
As of Nov. 11,2013

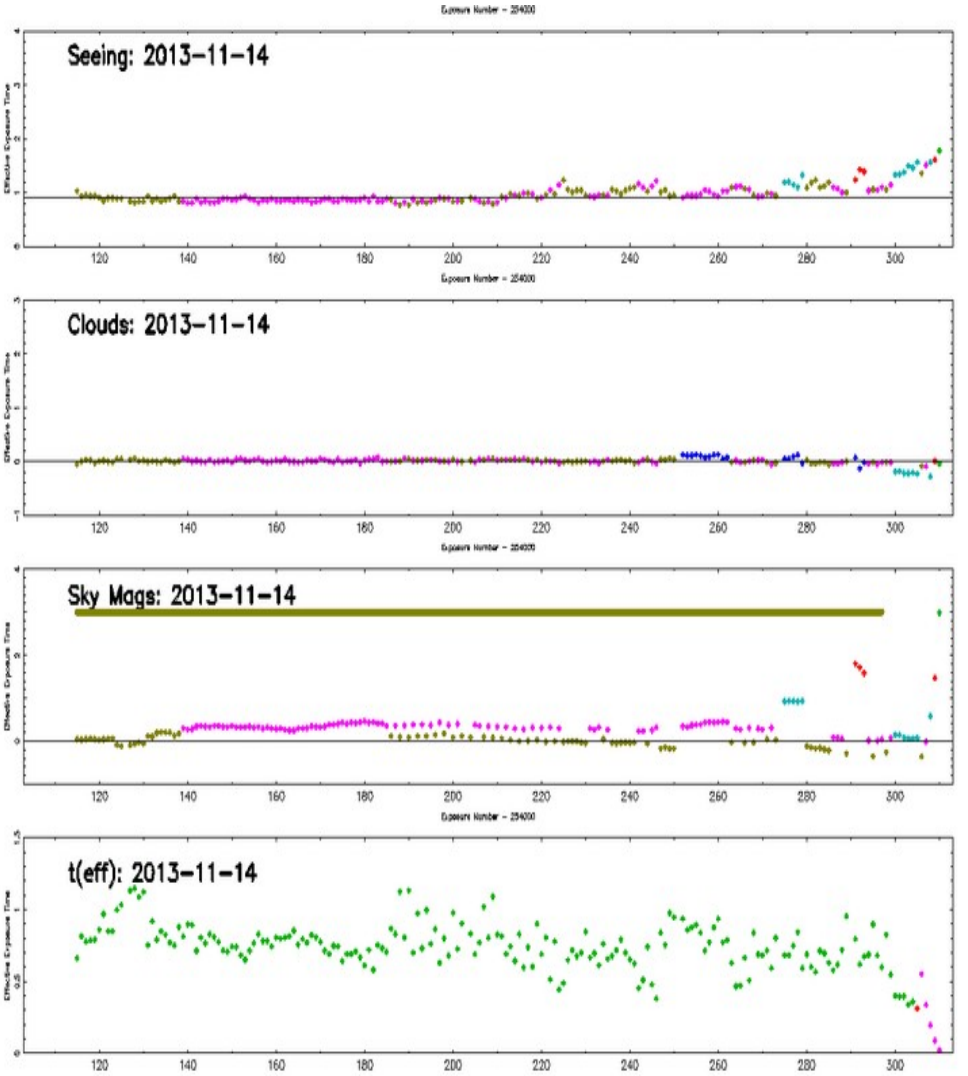
~30 hours (3.5 nights) behind.

Green: target to complete survey

Red: actual so far

Status vs. benchmark





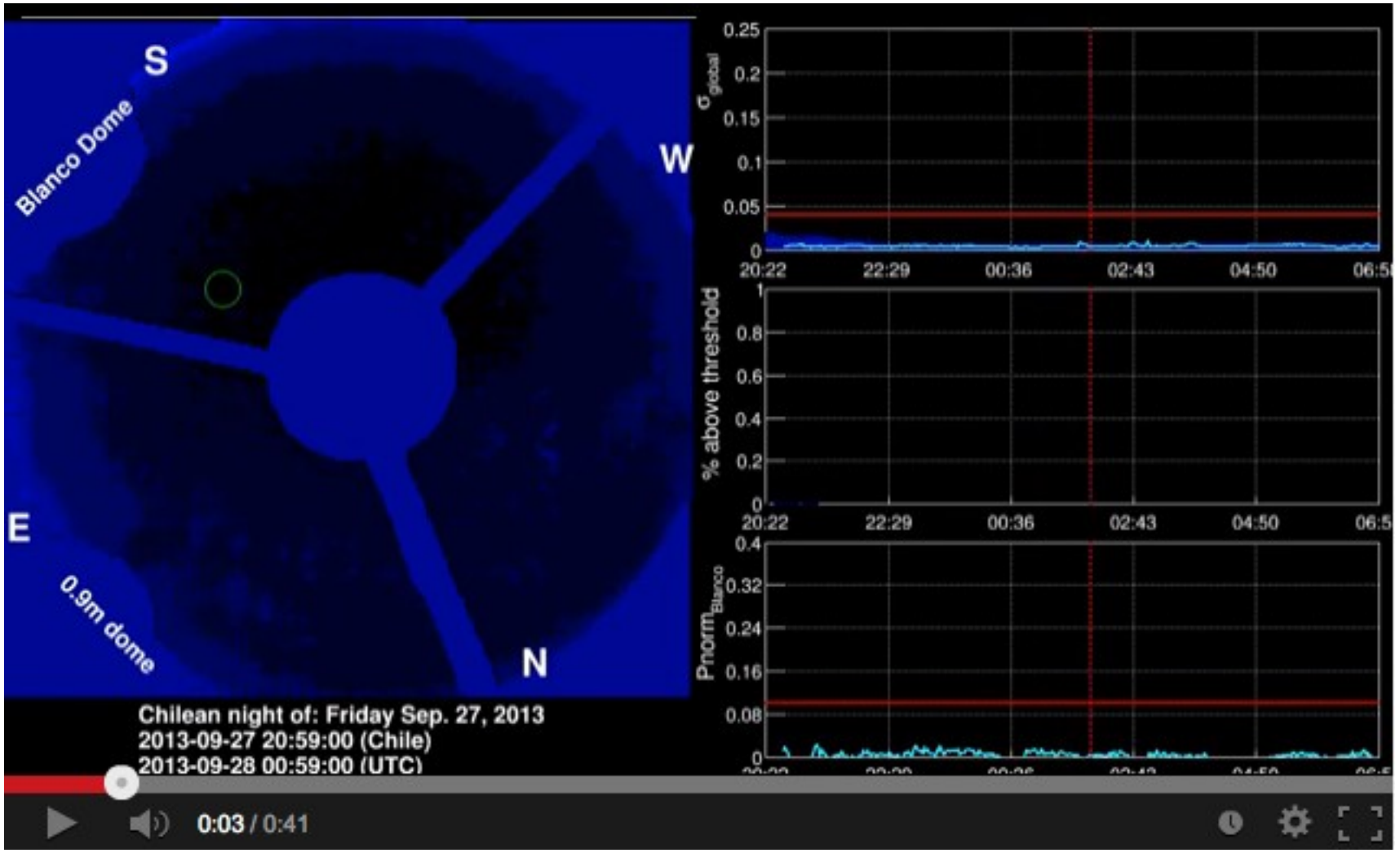
Bad night (clouds)

Good night (seeing, clear skies, little moon)

Nightly quality check: Red = bad, green = good for two nights.

Problem Issue recently uncovered:

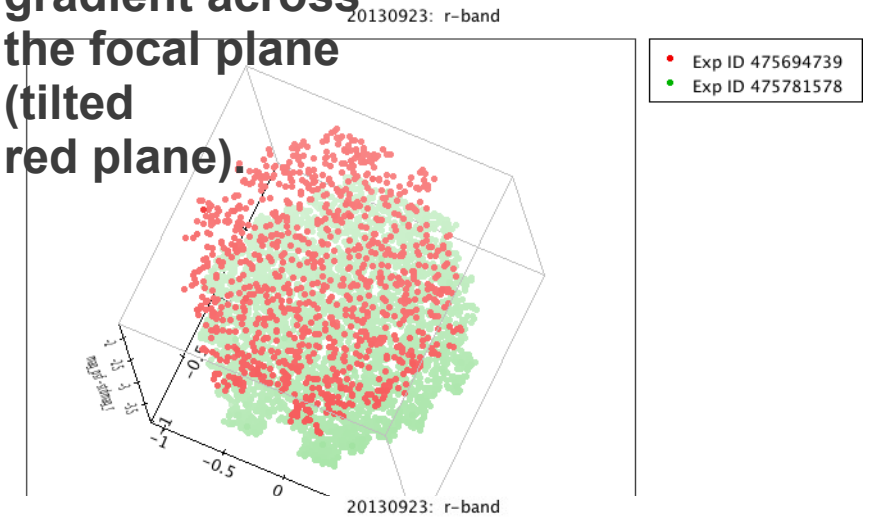
Figure shows Infrared all-sky camera on a clear night. black area indicates clear sky, no moon, thus this night should be ideal for photometric observing....

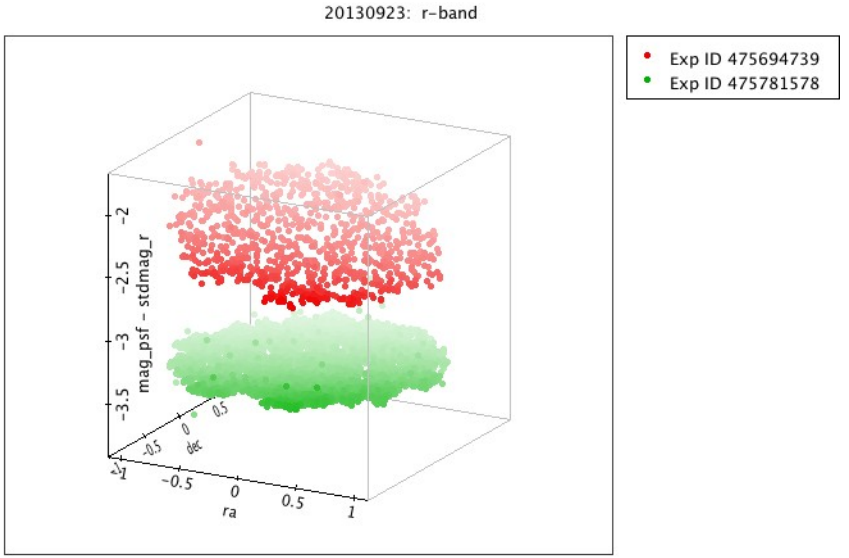


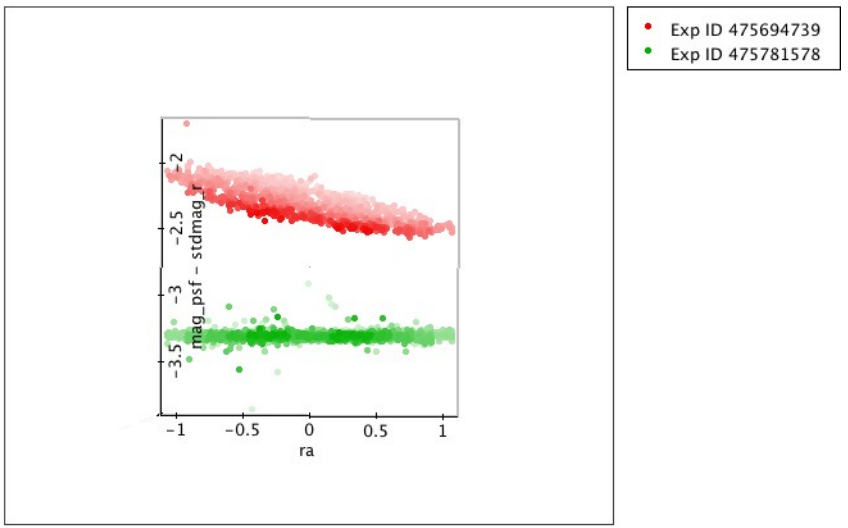
Raw Match: Night 20130923

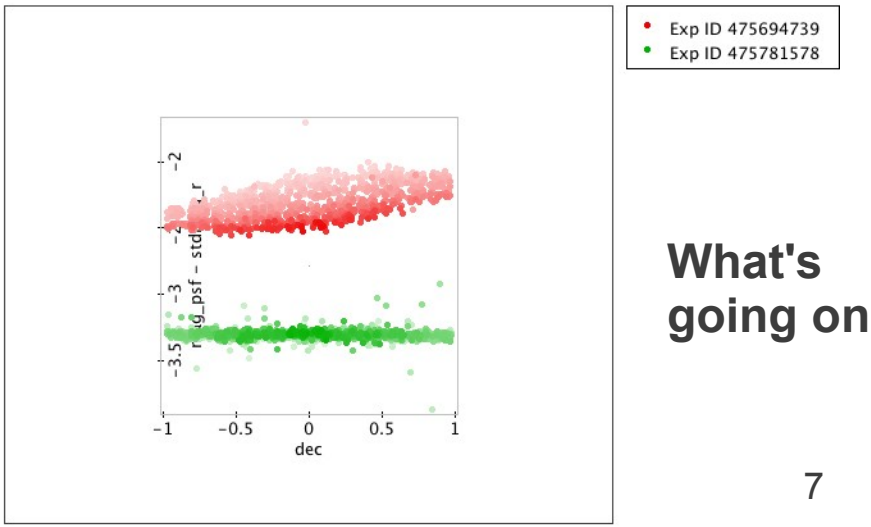
(Direct comparison of mag_psf with standard mags as a function of position on the focal plane)

In fact, however, some exposures from this night appear to have brightness gradient across the focal plane (tilted red plane).





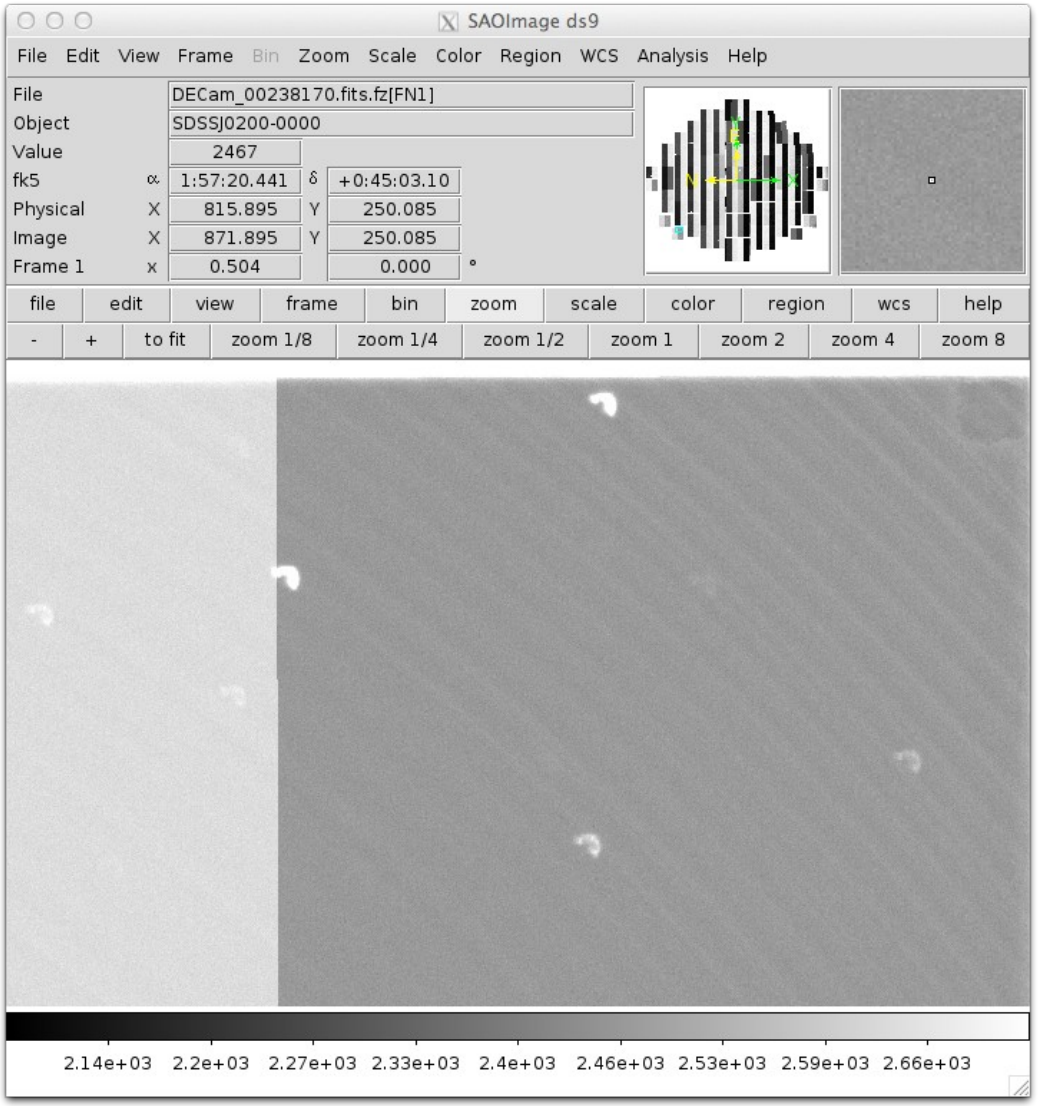




What's going on???

Raw Image Data: Night 20130923

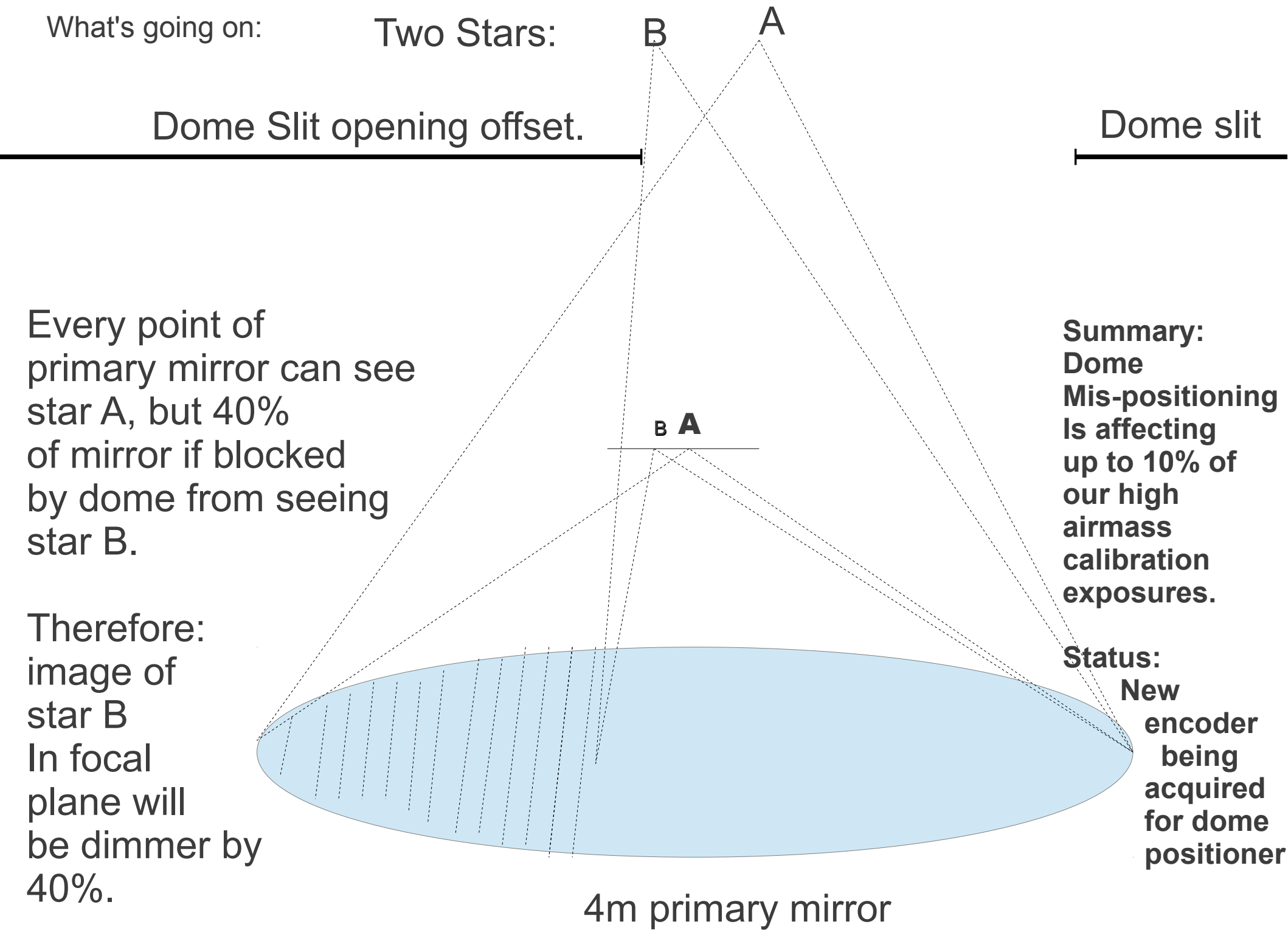
A look at out-of focus images, shows 'half-moon' effect...



Exp: DECam_00238170.fits
ExpID: 475694739
Field: SDSSJ0200+0000
Time: 09:40:24UT
Airmass: 1.71

What's going on:

Two Stars:



Every point of primary mirror can see star A, but 40% of mirror if blocked by dome from seeing star B.

Therefore: image of star B In focal plane will be dimmer by 40%.

Summary: Dome Mis-positioning Is affecting up to 10% of our high airmass calibration exposures.

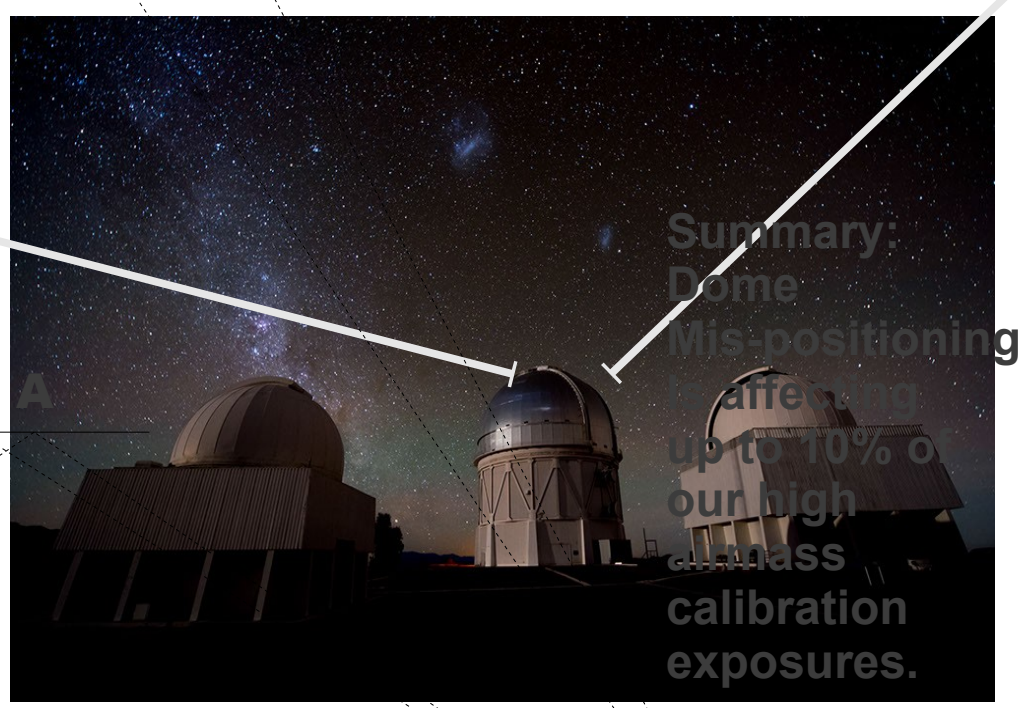
Status: New encoder being acquired for dome positioner

Two Stars: B A

DECAM has an especially large field of view --

Dome Slit opening offset.

Dome slit



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Status:
New encoder being acquired for dome positione

4m primary mirror

In spite of these early problems (being corrected), lots of interesting data being gathered.

Gravitational lenses (orange-red-dark foreground matter) bends light from blue background galaxies into arcs (DES SV)